EXPLANATION OF PLATE XIV.

Fig. 1. *Attus maderiana*, sp. n., ♀. Much enlarged.
Fig. 2. *Marpissa Grantii*, sp. n., ♀. Much enlarged.
Fig. 3. Ditto. Epigyne.
Fig. 4. *Marpissa ornata*, Thorell, ♀.
Fig. 5. Ditto. Side view.
Fig. 6. Ditto. Epigyne.
Fig. 7. *Misumena Clarkii*, sp. n., ♀. Caput, with ocular area.
Fig. 8. Ditto. Epigyne.
Fig. 9. *Lithyphantes nobilis*, Thorell. Dorsal view of abdomen.
Fig. 10. *Tegenaria pagana*, C. Koch. Epigyne of ♀.
Fig. 11. *Clubiona decora*, Blackwall, ♂. Dorsal view of abdomen.
Fig. 12. Ditto. Palpus of ♂.
Fig. 13. *Ariadne maderiana*, sp. n., ♀ (not quite mature). Much enlarged.

N.B.—The types of the species now described as new are deposited in the British Museum.

XXVI.—*On the Preservation of Teleostean Ova.*

By Walter E. Collinge, St. Andrews University.

Between October 1891 and July 1892 upwards of 80,000 ova have been examined at the St. Andrews Marine Zoological Laboratory, comprising some thirty known and four or five unknown species. Upon a large number of these I have made numerous experiments with various preservatives, of which the following notes are an account of the results obtained.

Killing.

The most satisfactory results were obtained by adding to a vessel containing the ova, with about an ounce of sea-water, three or four drops of a saturated solution of picric acid, to which had been added 5 per cent. of hydrochloric acid. In this diluted solution they were allowed to remain for *not longer* than three minutes, during which time they were kept in motion by a pipette. When the ova remained for longer than the time stated, or when the solution was too strong, the yolk was generally ruptured and considerable wrinkling took place in the zona radiata. In other cases the yolk became considerably contracted. Like results ensued if they were not well washed in fresh water before being transferred to the preservative fluid. After washing in dilute alcohol 12½–25 per cent., a slight opacity followed. If killed in a saturated solution of corrosive sublimate 6 parts and 3 parts

of glacial acetic acid, they were also opaque when transferred to any of the following fluids.

Preservatives.

Some dozen or so of picric mixtures were tried of which the following are the principal :—

(1) In equal parts of a sat. sol. picro-hydroch. ac. and 50-per-cent. alcohol ova of *Trigla gurnardus* shrank ·1524 millim. ; the yolk was contracted and opaque ; the oil-globule scarcely visible. In *Pleuronectes platessa* the shrinkage was slightly less *, being ·1447 millim.

(2) Sat. sol. picric acid 1 part, glycerine 1 part, 60-per-cent. alcohol 2 parts.—*Motella mustella* shrank ·1524 millim. ; the oil-globule was fairly distinct.

(3) Sat. sol. picric acid 2 parts, alcohol 1 part.—Results very similar to method 1. Shrinkage fully ·1524 millim. ; oil-globule poor and embryo indistinct.

(4) Sat. sol. picric acid 2 parts, 50-per-cent. alcohol 4 parts, 2-per-cent. acetic acid 1 part.—*Motella mustella* and *Trigla gurnardus* : oil-globule and embryo indistinct ; zona strongly wrinkled.

(5) Equal parts of sat. sol. picric acid, alcohol, and 2-per-cent. acetic acid.—The following ova were preserved in this fluid, of which the average shrinkage is given. The oil-globule, where present, was remarkably clear. Embryos very distinct. Ova previously prepared in other fluids, in which the oil-globule was scarcely or not at all visible, speedily came to view when allowed to remain in this fluid for five to twenty minutes.

Species.	Average shrinkage. millim.
Trigla gurnardus	·1447
Gadus morrhua	·1295
—— *æglefinus*	·1295
—— *minutus*	·1143
Motella mustella	·990
Brosmius brosme	·1371
Hippoglossus limandoides	·1524
Rhombus lævis	·1371
Arnoglossus laterna	·1447
Pleuronectes platessa	·914
Clupea sprattus	·1143

This was certainly the best of the picric solutions.

* The average is in all cases given.

(6) Alcohol 4 parts, 2-per-cent. acetic acid 4 parts, spirits of camphor 1 part.—The results here were very similar to the preceding fluid, but the embryos were not so distinct, owing to the slight opacity of the eggs; on the other hand, the shrinkage was very little. There are many objections to a picric solution which are here met. For general work or for preserving large collections of ova this is undoubtedly the best preservative I have used.

Species.	Average shrinkage. millim.
Trigla gurnardus	·1371
Gadus morrhua	·1295
—— *æglefinus*	·1295
—— *minutus*	·1143
Motella mustella	·914
Brosmius brosme	·1143
Hippoglossus limandoides	·1219
Rhombus lævis	·1143
Arnoglossus laterna	·1219
Pleuronectes platessa	·914
Clupea sprattus	·990

(7) The following mixtures of Kleinenberg's picro-sulphuric acid were tried:—

Picro-sulph.	1		2	1
Alcohol	0		2	2
2-per-cent. acetic acid	3	4 per cent.	2	1

The results in all cases were unsatisfactory. When the two parts of 4-per-cent. acetic were used the ova (*Trigla gurnardus*) were considerably distended.

(8) Very satisfactory results were obtained with 50-per-cent. alcohol. The shrinkage was small, the oil-globule, however, was indistinct; the dense opacity is also a disadvantage.

(9) Perenyi's fluid stained the eggs a very dark violet. Diluted with 8 parts of 50-per-cent. alcohol very satisfactory results were obtained. The shrinkage averaged ·1371 millim., and the embryo in all the species experimented with showed well.

When ova were not permanently required they were allowed to remain in a 2-per-cent. solution of acetic acid, or 4 parts of the same to 2 parts alcohol and 1 part Perenyi's fluid; both mixtures gave good results. When the embryos were well advanced they were allowed to remain in the former medium until considerable distension took place—about one hour or less. No effect was noticed upon the embryo until four or five hours.

In conclusion, it will be seen that the most satisfactory results were obtained by killing in the picro-hydrochloric acid and preserving in method 6.